

[illegible]

The diagram illustrates the electron transport chain (ETC) and oxidative phosphorylation. It shows the flow of electrons from NADH through Complex I (I), Complex II (II), Complex III (III), and Complex IV (IV) to oxygen (O_2), which is reduced to water ($2H_2O$). Protons (H^+) are pumped from the matrix to the intermembrane space at Complex I, III, and IV. ATP synthase uses the proton gradient to synthesize ATP from ADP and P_i .

Complex I (I): NADH is oxidized to NAD^+ , and FMN is reduced to $FMN H_2$. Electrons flow through a series of carriers, including ubiquinone (Q), which is reduced to ubiquinol (QH_2). Protons are pumped from the matrix to the intermembrane space.

Complex II (II): Succinate is oxidized to fumarate, and $FADH_2$ is reduced to FAD . Electrons flow through a series of carriers, including ubiquinol (QH_2), which is oxidized to ubiquinone (Q). Protons are pumped from the matrix to the intermembrane space.

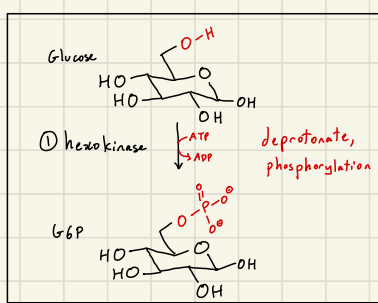
Complex III (III): Ubiquinol (QH_2) is oxidized to ubiquinone (Q). Electrons flow through a series of carriers, including ubiquinol (QH_2), which is reduced to ubiquinol (QH_2). Protons are pumped from the matrix to the intermembrane space.

Complex IV (IV): Ubiquinol (QH_2) is oxidized to ubiquinone (Q). Electrons flow through a series of carriers, including ubiquinol (QH_2), which is reduced to ubiquinol (QH_2). Protons are pumped from the matrix to the intermembrane space.

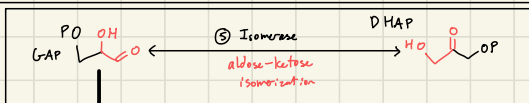
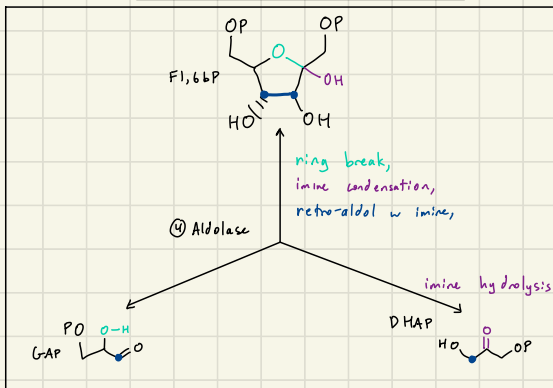
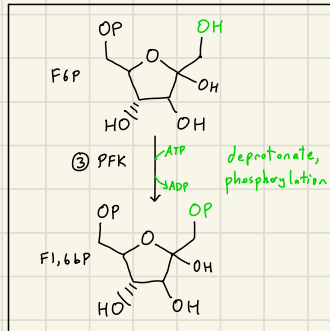
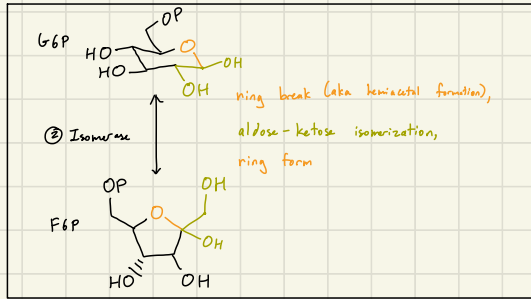
ATP synthase: Protons flow from the intermembrane space through ATP synthase, driving the synthesis of ATP from ADP and P_i .

Glycolysis Investment

Don't need to memorize,
but know general steps
+ byproducts

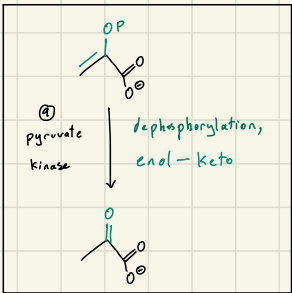
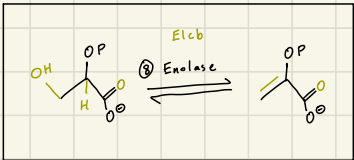
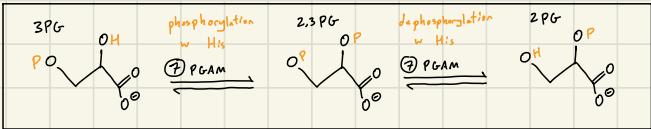
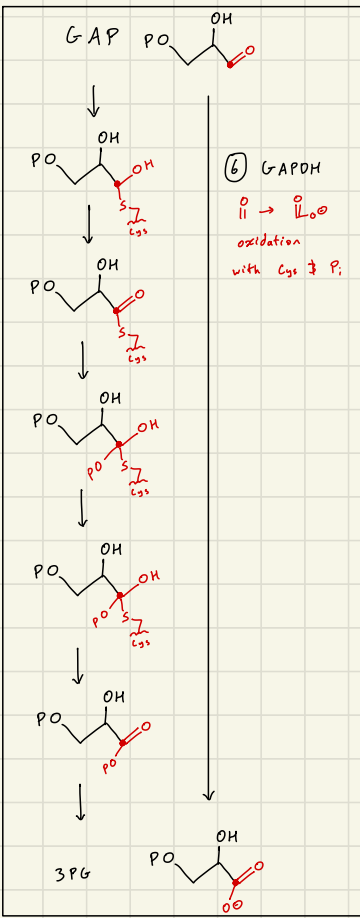


BUT be able
to infer/figure out
steps & mechanisms needed
between any 2 intermediates



glycolysis payoff

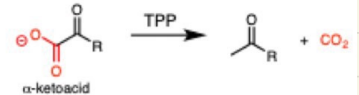
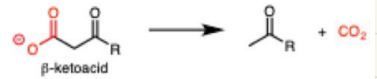
Glycolysis Payoff (x2 per glucose)



TCA / Krebs

STRATEGY: release CO_2 as the driving force!

Decarboxylation Strategies



STEP 6-8
4 C unit
Oxidation &
reorganization

